

WHAT IS CLAIMED IS:

1. An electronic device comprising:

two transmission-receiving antennas respectively adapted to different frequency bands;

5 a receiving antenna for the frequency bands which forms two diversity antennas together with the transmission-receiving antennas; and

a wireless communication unit, connected to the transmission-receiving antennas and the receiving antenna, which performs wireless communication in each of the frequency bands.

2. The electronic device according to claim 1, wherein

15 the receiving antenna is provided between the transmission-receiving antennas.

3. The electronic device according to claim 1, wherein

20 the transmission-receiving antennas include a first transmission-receiving antenna adapted to a relatively high frequency band and a second transmission-receiving antenna adapted to a relatively low frequency band; and

25 the receiving antenna is disposed at a predetermined distance from the first and second transmission-receiving antennas, thereby constituting the diversity antenna adaptive to each of the frequency bands.

4. The electronic device according to claim 1,  
wherein

the transmission-receiving antennas include the  
first transmission-receiving antenna adapted to a first  
5 frequency band on a wavelength  $\lambda_a$  and the second  
transmission-receiving antenna adapted to a second  
frequency band on a wavelength  $\lambda_b$ ; and

the receiving antenna is

disposed at a distance of  $(2n + 1) * \lambda_a / 4$

10 (however,  $n = 1, 2, 3, \dots$ ) from the first  
transmission-receiving antenna, and

disposed at a distance of  $(2n + 1) * \lambda_b / 4$

(however,  $n = 1, 2, 3, \dots$ ) from the second  
transmission-receiving antenna.

15 5. The electronic device according to claim 1,  
wherein

the wireless communication unit includes a filter  
circuit for separating a radio frequency signal  
received by the receive-dedicated antenna into signals  
20 in the respective frequency bands.

6. An electronic device comprising:

a display unit which hold a display panel;

an antenna unit including three antennas provided  
at a portion of the display unit; and

25 a wireless communication unit which is connected  
to the antennas and achieves a wireless communication  
function in first and second frequency bands,

wherein the antenna unit has:

two transmission-receiving antennas respectively adapted to the first and second frequency bands; and

5 a receiving antenna for the frequency bands and disposed at a predetermined distance from each of the transmission-receiving antennas, thereby constituting a diversity antenna adaptive to the frequency bands.

7. The electronic device according to claim 6, wherein

10 the receiving antenna is provided between the two transmission-receiving antennas.

8. The electronic device according to claim 6, wherein

15 the antenna unit is provided at a portion of the display unit on a side opposite to the display panel;

the transmission-receiving antennas include a first transmission-receiving antenna adapted to a first frequency band on a wavelength  $\lambda_a$  and a second transmission-receiving antenna adapted to a second

20 frequency band on a wavelength  $\lambda_b$ ; and

the receive-dedicated antenna is

disposed at a distance of  $(2n + 1) * \lambda_a / 4$  (however,  $n = 1, 2, 3, \dots$ ) from the first transmission-receiving antenna, and

25 disposed at a distance of  $(2n + 1) * \lambda_b / 4$  (however,  $n = 1, 2, 3, \dots$ ) from the second transmission-receiving antenna.

9. The electronic device according to claim 6,  
wherein

the transmission-receiving antennas include the  
first transmission-receiving antenna adapted to the  
5 first frequency band on the wavelength  $\lambda_a$  and the  
second transmission-receiving antenna adapted to  
the second frequency band on the wavelength  $\lambda_b$ ;

the receive-dedicated antenna is  
configured to be disposed at a distance of " $(2n +$   
10  $1) * \lambda_a / 4$  (however,  $n = 1, 2, 3, \dots$ ) from the first  
transmission-receiving antenna, and disposed at a  
distance of " $(2n + 1) * \lambda_b / 4$  (however,  $n = 1, 2, 3, \dots$ )  
from the second transmission-receiving antenna; and  
the antenna unit is provided at a portion of the  
15 display unit to adapt to space diversity effects and  
polarization diversity effects.

10. The electronic device according to claim 6,  
wherein

the wireless communication unit includes a filter  
20 circuit for separating a radio frequency signal  
received by the receive-dedicated antenna into signals  
in the respective frequency bands.

11. An antenna unit for achieving a wireless  
communication function in different frequency bands are  
25 first and second frequency bands, the antenna unit  
comprising:

a first transmission-receiving antenna adapted to

the first frequency band;

a second transmission-receiving antenna adapted to the second frequency band;

5 a receiving antenna for the first and second frequency bands and disposed at a predetermined distance from each of the first and second transmission-receiving antennas, thereby constituting a diversity antenna adaptive to the frequency bands.

10 12. The electronic device according to claim 11, wherein

the receiving antenna is provided between the first and second transmission-receiving antennas.

13. The antenna unit according to claim 11, wherein

15 when a wavelength in the first frequency band is  $\lambda_a$ , and a wavelength in the second frequency band is  $\lambda_b$ ,

the receive-dedicated antenna is

20 disposed at a distance of  $(2n + 1) * \lambda_a / 4$  (however,  $n = 1, 2, 3, \dots$ ) from the first transmission-receiving antenna, and

disposed at a distance of  $(2n + 1) * \lambda_b / 4$  (however,  $n = 1, 2, 3, \dots$ ) from the second transmission-receiving antenna.